



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/717,355	11/19/2003	Yuan-Chang Huang	64,600-122	8636
570	7590	08/24/2005	EXAMINER	
AKIN GUMP STRAUSS HAUER & FELD L.L.P. ONE COMMERCE SQUARE 2005 MARKET STREET, SUITE 2200 PHILADELPHIA, PA 19103			VU, HUNG K	
			ART UNIT	PAPER NUMBER
			2811	

DATE MAILED: 08/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/717,355

Applicant(s)

HUANG, YUAN-CHANG

Examiner

Hung Vu

Art Unit

2811

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 June 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1 – 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lay et al. (US 2002/0048924) in view of Kim (KP 00171099, of record).

Lay et al. discloses, as shown in Figures 3A – 6B, a microelectronic structure comprising:

a substrate (34) comprising circuits therein and a top surface;

at least one first conductive bump (42) situated on the top surface providing electrical communication to the circuits, the at least one conductive bump having a sidewall (44) formed of an electrically insulating material, the portions of the at least one conductive bump other than the sidewall being a unitary structure, the top surface of the conductive bump being uncovered and directly exposed to its surrounding.

Lay et al. does not disclose the substrate is a semi-conducting substrate. However, Kim discloses a microelectronic structure comprising a substrate (11) being a semi-conducting substrate. Note Figures 1-4 of Kim. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the substrate of Lay et al. being a semi-conducting substrate, such as taught by Kim since semi-conducting substrate is conventionally used as the substrate to form the integrated circuit.

Art Unit: 2811

Regarding claims 2 and 11, Lay et al. and Kim disclose the sidewall formed of the electrically insulating material at least partially covers a periphery of at least one first conductive bump.

Regarding claims 3 and 12, Lay et al. and Kim disclose the sidewall formed of the electrically insulating material covers completely a periphery of the at least one first conductive bump while leaving the top surface of the at least one first conductive bump exposed.

Regarding claim 4, Lay et al. and Kim disclose the sidewall formed of the electrically insulating material at least covers a section of the sidewall in the periphery of the at least one first conductive bump that is juxtaposed to a second conductive bump situated immediately adjacent to the at least one first conductive bump.

Regarding claim 5, Lay et al. and Kim disclose the electrically insulating material comprises organic material and inorganic material.

Regarding claim 6, Lay et al. and Kim disclose all of the claimed limitations except material of electrically insulating material. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the device of Kim having the materials as that claimed by Applicant, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

Regarding claims 7 and 13, Lay et al. and Kim disclose the at least one first conductive bump is formed of a conductive metal selected from the group consisting of Au, Ag, Pt, Pd, Al, Cu, Sn and alloys thereof.

Regarding claim 8, although Lay et al. and Kim do not teach the height of the conductive bump, as that claimed by Applicants, however, it would have been obvious to one having ordinary skill in the art at the time the invention was made to form the bump having a desired height, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claim 9, Lay et al. discloses, as shown in Figures 3A – 6B, a microelectronic assembly comprising:

- a substrate (34) having at least one conductive bump (42) situated on a top surface, the at least one conductive bump having a sidewall (44) formed of an electrically insulating material, the portions of the at least one conductive bump other than the sidewall being a unitary structure, the top surface of the conductive bump being uncovered and directly exposed to its surroundings;

- an electronic substrate (30) having at least one conductive pad (32) situated on a top surface;

- an anisotropic conductive film (38) sandwiched in-between the semi-conducting substrate and the electronic substrate, the anisotropic conductive film comprising at least one electrically conductive particle (39) providing electrical communication between the at least one conductive

Art Unit: 2811

bump and the at least one conductive pad, the top surface of the conductive bump thereby being directly exposed to the at least one particle in the anisotropic conductive film.

Lay et al. does not disclose the substrate is a semi-conducting substrate. However, Kim discloses a microelectronic structure comprising a substrate (11) being a semi-conducting substrate. Note Figures 1-4 of Kim. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the substrate of Lay et al. being a semi-conducting substrate, such as taught by Kim since semi-conducting substrate is conventionally used as the substrate to form the integrated circuit.

Regarding claim 10, Lay et al. and Kim disclose the semi-conducting substrate is an integrated circuit chip and the electronic substrate is a printed circuit board or a glass substrate.

Response to Arguments

2. Applicant's arguments with respect to claims 1 and 9 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

3. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO**

Art Unit: 2811

MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

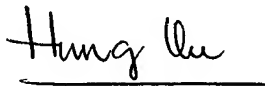
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung K. Vu whose telephone number is (571) 272-1666. The examiner can normally be reached on Tuesday-Friday 6:00-4:30, Eastern Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's acting supervisor, Steven Loke can be reached on (571) 272-1657. The Central Fax Number for the organization where this application or proceeding is assigned is (571) 273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Vu

August 18, 2005

A handwritten signature in black ink, appearing to read "Hung Vu", is written over a horizontal line.

Hung Vu

Primary Examiner